British Columbia

Oil and Gas Environmental Policy Program

Promoting Sustainable Resource Development

Report on 2004/2005
Reclamation Projects

106-0 5652 /

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Introduction

The Environmental Policy Program of the Ministry of Energy, Mines and Petroleum Resources helps to address the Province's strategic objective of maintaining healthy communities and a sustainable environment. The purpose of the program is to identify and mitigate environmental issues in the petroleum sector. Initiated in 2004, the program addresses the Ministry's goals to maintain and increase investment in energy and to maintain high environmental standards. Tackling environmental issues also helps to build vibrant communities and to ensure that industry has the opportunity for a long-term future in the responsible development of oil and gas resources in BC.

While the Ministry of Energy, Mines and Petroleum Resources administers and manages the program, other provincial agencies provide leadership and coordinate individual projects. These agencies include the Ministry of Environment, the Ministry of Agriculture and Lands and BC's Oil and Gas Commission.

The program is committed to supporting projects that provide better stewardship in the oil and gas industry, and continued improvement in environmental and health and safety performance. In 2004/2005, some $600,000 was invested in a variety of projects that focus on environmental waste management, habitat enhancement, planning initiatives and industry best management practices.

Project results will be used by industry and government agencies in a variety of ways: from establishing environmental guidelines, targets and best management practices, to providing more certainty on the landbase by identifying important First Nations sites.

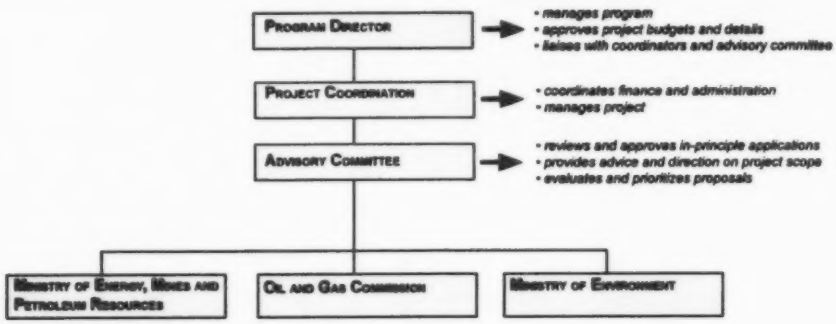
Some key program achievements to date include the completion of:

- Guidelines for regulatory air quality dispersion modeling
- A code of practice for the discharge of produced water from coalbed gas operations
- A deep well disposal policy
- A low flow watershed model
- Moose and caribou inventories in two wildlife management units

This annual report provides detailed summaries of 2004/2005 project work.

MAINTAINING HEALTHY COMMUNITIES AND A SUSTAINABLE ENVIRONMENT

Program Organization 2004/2005


Program Director
• manages program
• approves project budgets and details
• liaises with coordinators and advisory committee
Project Coordination
• coordinates finance and administration
• manages project
Advisory Committee
• reviews and approves in-principle applications
• provides advice and direction on project scope
• evaluates and prioritizes proposals
Ministry of Energy, Mines and Petroleum Resources
Oil and Gas Commission
Ministry of Environment

List of Environmental Policy Program Projects

Project	Status
Oil and Gas Waste Regulation User's Guide	Ongoing through 2005
Drilling Waste Guidelines	Ongoing through 2005/06
Guidelines for Air Quality Dispersion Modeling in British Columbia	Completed March 2005
Coalbed Gas Produced Water	Completed March 2005
Deep Well Disposal Policy	Completed March 2005
Management of Water Withdrawals from Streams	Completed March 2005
Stream Classification for the Oil and Gas Industry	Completed March 2005
Ladyfern/Chinchaga Caribou Telemetry	Anticipated completion October 2005
Boreal Caribou Habitat Enhancement Trials and Wolf Study	Anticipated completion March 2006
Moberly Tract Moose Inventory	Anticipated completion March 2007
Moose Population Parameters in the East Beatton and South Fontas	Completed March 2005
Methodologies for Large Ungulate Habitat Improvement	Completed April 2005
Peace Moberly Tract Planning	Completed March 2005
Terrestrial and Aquatic Best Management Practices	Completed March 2005
Environmental Compliance Audit Framework	Completed March 2005
Pipeline Abandonment Risk Assessment	Completed March 2005
Flare and Sump Pits Inventory and Action Plan Tracking Tool	Anticipated completion November 2005
First Nations Special Sites Inventory and Identification	Ongoing through 2005

Oil and Gas Waste Regulation User's Guide

Project Description:
Development of a user's guide for the Oil and Gas Waste Regulation.

Project Information:
Both industry and government had previously identified several urgent amendments to the Oil and Gas Waste Regulation. Examples of these amendments include improvements to regulations concerning discharge of runoff and the handling of drilling waste. As a precursor to developing the user's guide, these amendments were made a priority through the Environmental Policy Program. Extensive consultation was undertaken with both the Oil and Gas Commission (OGC) and the Canadian Association of Petroleum Producers in reviewing and developing the amendments.

Benefits:
The guide will clarify the Oil and Gas Waste Regulation for users resulting in better planning by industry and improved compliance.

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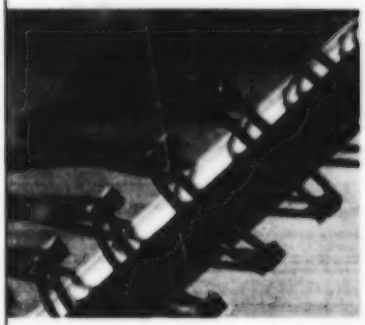

Clarifying the Oil and Gas Waste Regulation for users

Drilling Waste Guidelines

Project Description:
Working in conjunction with the Alberta Energy Utilities Board (EUB), the project substantially updates guidelines for the management of oil and gas drilling wastes, and includes new standards for the management of salt contaminated wastes.

Project Information:
The project consolidated results of a drilling waste review process initiated by the EUB and prepared the recommended regulatory position. As well, it initiated file reviews of specific management techniques identified as needing further assessment. With involvement from key industrial stakeholders, the project maintains harmony with regulatory requirements that exist in British Columbia and Alberta.

Looking ahead, the EUB will prepare new drilling waste disposal guidelines from recommendations flowing from the review process. The Province will undertake its own comprehensive review of the new disposal guidelines prior to making any commitments to BC guidelines.

Benefits:
Project outcomes include streamlining the approval process while increasing environmental protection. The improved guidelines also create increased regulatory certainty for oil and gas companies conducting drilling.

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Streamlining the approval process while increasing environmental protection

Guidelines for Air Quality Dispersion Modeling in British Columbia

Improving air quality modeling results

Project Description:
In order to promote technical rigor, consistency, clarity of expectations, and efficiency in decision-making, many environmental regulatory agencies have developed guidelines for air quality modeling. This project aims to create a guideline for British Columbia that is intended to be of broad benefit for all dispersion modeling applications in the province. It will also include a section that provides guidance to air quality consultants on well-flaring applications.

Project Information:
Air Quality Dispersion Models are standard tools used to assess the air quality impacts of emissions. It is critical that these models are accurate so that decisions around air quality are based on correct information. There are a variety of dispersion models, each with its own unique capabilities and uncertainties. The development of this guideline—which will exist in draft form for a one year evaluation period from April 2005 to April 2006 before it is finalized—included input from dispersion modeling consultants and staff from the Ministry of Environment and the Greater Vancouver Regional District.

Benefits:
The guidance provided in the document will help improve air quality modeling results, provide more clarity on requirements to consultants/industry, and promote more certainty for industry in planning activities.

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Coalbed Gas Produced Water

Project Description:
The objective of this project is to help resolve potential environmental issues related to coalbed gas exploration and development. A primary focus of the project has been the development of a Code of Practice that provides environmental standards and requirements for managing produced water from coalbed gas operations. Other project components include the addition of new water wells to the provincial groundwater observation well network, and the compilation of regional water chemistry data for southeast British Columbia. The project is conducted primarily by the Ministry of Environment in collaboration with the Ministry of Energy, Mines and Petroleum Resources and the Oil and Gas Commission.

Background:
Natural gas is a vital component to the province's energy supply and economic well being, but the production from conventional sources throughout much of North America is in decline. Natural gas found in underground coal deposits, known as coalbed gas (CBG), may be nearly pure methane (not sour) and ready for use. During production, water may need to be pumped out of the coal seams to allow the gas to be collected. The water may be re-injected or, if it meets the rules and environmental standards of the Code of Practice, it may be discharged to streams or to the ground via infiltration. The code was developed through extensive research and study of relevant jurisdictions. The provincial observation well network has about 150 wells covering major groundwater areas of the province. The primary purpose of the network is to collect, analyze and interpret groundwater hydrographs and ground water quality data from various aquifers in BC.

Benefits:
The Code of Practice for CBG produced water sets out the legal requirements and standards to authorize the discharge of water so that the environment continues to be properly protected. The code also requires industry to consider the beneficial use of this water. Industry can also choose to treat lower quality water so that it meets usage standards. Other components of this project will provide background data on ground and surface water quality.

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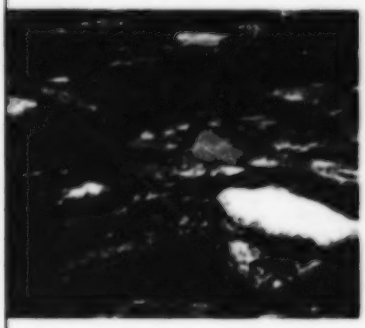
http://www.em.gov.bc.ca/subwebs/coalbedgas/



Ensuring the environment continues to be properly protected

Management of Water Withdrawals from Streams

Improving the ability to manage cumulative impacts on the landscape

Project Description:
The project is designed to improve the management of water withdrawal from streams for oil and gas development activities by developing a risk assessment tool based on hydrological data.

Project Information:
Milestones of the project included a map of approved water sources in northeast BC, development of best management practices for water withdrawals, and watershed model implementation trials with the Oil and Gas Commission and the Ministry of Environment.

Benefits:
As a result of managing at a larger (watershed) scale, the project should result in improved efficiency by the Oil and Gas Commission in managing and reducing the number of permits issued for water withdrawals. It also improves the Ministry of Environment's ability to manage cumulative impacts on the landscape.

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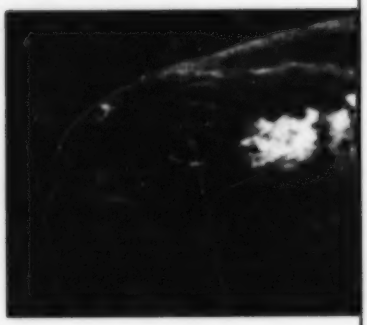
Stream Classification for the Oil and Gas Industry



A more accurate method of classifying streams

Project Description:
Using fish inventory data from the Fort St. John Forest District, this project developed a stream classification method based on predicting the probability of stream use by sport fish in the Peace Region of British Columbia.

Project Information:
The project identified and synthesized available up-to-date data and developed a ranking system for streams based on the probability of use by sport fish. Outputs included identifying watersheds with insufficient data on which to base predictive models, reviewing consistency and status of previously developed Local Area Agreements and Stream Default Agreements, and mapping zones of predictive consistency based on species distribution.

Benefits:
Results from the classification project will provide the Oil and Gas Commission with a more accurate method of classifying streams by probability of use by sport fish species. This, in turn, will determine permit conditions for working in and around streams. The project also has the potential to significantly reduce the cost of unnecessary stream surveys and to better direct the expenditures of funds on fish sampling.

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Ladyfern/Chinchaga Boreal Caribou Telemetry Project

Project Description:
This radio telemetry study uses Global Positioning System (GPS) collars to track the Chinchaga herd of Boreal Caribou in the Milligan Hills and Ladyfern areas of northeast BC (see page 13 for project map).

Project Information:
The study objective is to determine habitat selection and avoidance by Boreal Caribou in the Ladyfern area so that appropriate caribou protection guidelines can be implemented in areas of high caribou use. Study activities completed in 2004/2005 included a calf survey and a rut survey. In addition, nine of the 12 GPS collars used to track caribou were recovered. Monitoring of unrecovered caribou collars—and wolves collared in March 2005—will continue.

Benefits:
The project will protect Boreal Caribou through the development of guidelines for resource development in Boreal Caribou habitat. It will allow for the findings of the Snake/Sahtaneh Caribou Study (jointly led by the Oil and Gas Commission and Slocan Forest Products) and the OGC's Interim Caribou Guidelines to be evaluated over a larger area of northeast BC, resulting in greater certainty for industrial development and regulatory agencies.

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Tracking Boreal Caribou

Boreal Caribou Habitat Enhancement Trials/ Wolf Study

Project Description:
The intent of this two-year project is to evaluate if caribou are being drawn to areas reseeded as part of oil and gas reclamation activity and to determine the nature of the attractant. A further component of the study is to evaluate the extent to which wolves are avoiding areas of human presence. As part of the project, Boreal Caribou enhancement trials are also being developed that may help mitigate the impacts of industrial development in the ungulate's habitat. (See page 13 for project map.)

Project Information:
Study activities include locating areas of caribou forage activity on industrial sites and collecting pellet samples for forage analysis. The wolf component of the study involves capturing and collaring six to eight wolves with GPS collars to track their movements.

Benefits:
Project benefits include increased knowledge of both Boreal Caribou and wolves near industrial sites. The results of the enhancement trials may help mitigate the impacts of industrial development in the ungulate's habitat and improve caribou habitat and resource management in the area.

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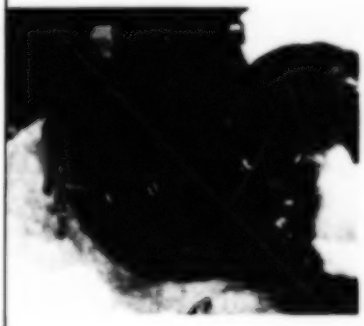
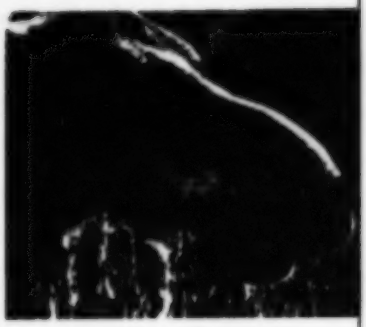


Tracking wolf movements with GPS

Moberly Tract Moose Inventory



Achieving a balance and a more thorough understanding of moose populations

Project Description:
This is a large scale, multi-phase moose/elk population study in areas south of the Peace River (see page 13 for project map).

Project Information:
There has been concern that there is an inadequate supply of large ungulates (especially moose) to meet harvesting needs, and that petroleum activities will further reduce that supply. Initial focus is on the number of moose and elk (and their population parameters) in the Pine-Moberly area. Subsequent efforts will focus on the Murray River area, ultimately determining the demand for moose (and other large ungulates) in both areas by March 2007. Using a stratified random sampling method, information gathered in the Pine-Moberly area included estimated population size, density and composition. These estimates will be compared to values obtained from previous studies conducted within the management unit.

Benefits:
The results from the project will help match the supply of moose (and other large ungulates) to harvest demands, focusing on how balance can be achieved.

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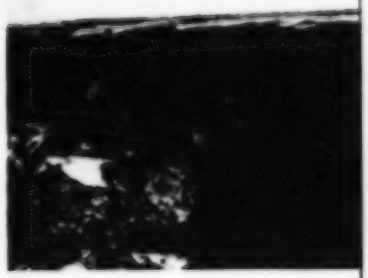
Moose Populations in the East Beatton/South Fontas



Assisting in future resource management decisions

Project Description:
This is a two-part project to determine the current population parameters of moose within the study area, located north of Fort St John, followed by a determination of local harvest pressures and community demands for moose (see page 13 for project map).

Project Information:
Moose is a species of great interest to First Nations as well as other consumptive wildlife users. This project was initiated in order to gather information regarding the status of moose within an area of importance to First Nations and other users. A report was written detailing moose population estimates, age-structure, and sex composition within the study area.

Benefits:
This project will provide a more thorough understanding of current moose population dynamics within the East Beatton/South Fontas area and will assist in future resource management decisions. Specifically, the project will provide an accurate estimate of moose populations within the area (along with estimates of sustainable harvest levels) and an evaluation of harvest potential of other wildlife species. A further outcome of the project is enhanced working relationship between the BC government and Treaty 8 First Nations.

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Methodologies for Large Ungulate Habitat Improvement in Relation to Concurrent Industrial Development

Project Description:
This project is a review of the literature on methodologies that can be used to improve habitat for large ungulates (specifically moose and elk). These methodologies will assist in developing best management practices for industry and government in areas where increasing ungulate populations have been identified as a management objective. The methodologies will go beyond minimizing losses to large ungulate populations, and instead focus on restoration of habitat, creation of forage, and other compensatory measures to initiate population growth.

Project Information:
The project deliverables include a panel-reviewed report on habitat alteration practices, a panel-reviewed decision making matrix, and a list of pertinent literature sources.

Benefits:
The study illustrates how industrial activity co-exists and supports the goal of matching large ungulate populations to harvesting needs as determined by wildlife managers.

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A focus on restoration of habitat

Peace Moberly Tract Planning

Project Description:
This planning initiative assists the Salteau and West Moberly First Nations to develop Phase 1 of a Sustainable Resource Management Plan (SRMP) for the Peace Moberly Tract, located south of Fort St. John (see page 13 for tract location). Phase 1 involves designating co-chairs, establishing the land-planning table, establishing a Terms of Reference, and setting a budget and recommendations for interim strategies. Target for completion of this planning process is within one year of establishing the land-planning table.

Project Information:
The Peace Moberly Tract has high oil and gas potential and an established gas field on its eastern boundary. Without the proper planning framework in place, existing and future tenure holders have no certainty around surface development requirements.

Benefits:
Through this detailed planning process, First Nations interests around land management in the area can be better addressed. In addition, exploration requirements of existing tenure holders can be met and future tenure holders will have certainty around surface development requirements.

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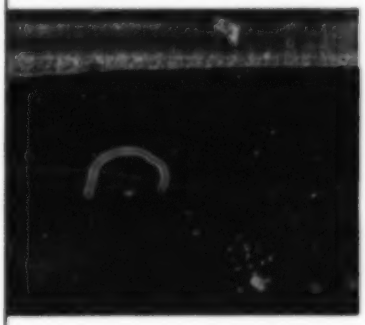

Building First Nations Relations and Participation

Terrestrial and Aquatic Best Management Practices

Contributing to meeting Land and Resource Management Plan objectives

Project Description:
The project focuses on developing and assessing clear, effective and relevant best management practices (BMPs) for oil and gas companies to follow. These BMPs will contribute to meeting Land and Resource Management Plan (LRMP) objectives relating to ecological values in the Fort Nelson, Fort St. John and Mackenzie Forest Districts.

Project Information:
Working with staff from the Oil and Gas Commission, the Canadian Association of Petroleum Producers, the Ministry of Environment and Canfor, a contract biologist was retained to develop best management practices for the oil and gas industry. The project goals are to summarize existing policies, list best management practices, compare existing policies to proposed best management practices, and prepare a final set of aquatic and terrestrial BMPs for printing and website posting. This project is linked with the Best Management Practices Working Group of the Ministry of Energy, Mines and Petroleum Resources.

Benefits:
Developing these best management practices will assist the oil and gas industry in meeting environmental goals, and provide greater clarity and consistency for oil and gas operators. The BMPs developed will comprise strategies and tactics that can help bring about long term economic benefits while meeting objectives relating to environmental sustainability.

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Environmental Compliance Audit Framework

Meeting the needs of government and industry stakeholders

Project Description:
As part of its shift towards a performance-based approach to managing oil and gas development, the OGC executive is establishing a program and framework to evaluate compliance assurance systems for its oil and gas clients. This will take the form of an effective audit program for assessing the compliance control framework of oil and gas companies.

Project Information:
Results delivered through the project include a clear explanation of compliance assurance systems, a summary of existing compliance systems, and a draft and final version of compliance assurance audit protocols.

Benefits:
The project develops a framework for assessing client compliance assurance systems in a timely and efficient manner that meets the needs of government and industry stakeholders.

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Pipeline Abandonment Risk Assessment

Project Description:
The oil and gas industry and provincial government authorities recognize the need to develop guidelines that companies can follow in order to abandon oil and gas pipelines safely, economically and in an environmentally sound manner. This project focuses on identifying risks to the Crown by granting pipeline abandonment to oil and gas companies.

Project Information:
The OGC is not currently granting leave to abandon a pipeline, pursuant to Section 9 of the Pipeline Act, except where the line has been removed in its entirety and the land restored. This risk assessment will provide the OGC with new guidelines for the abandonment of pipelines in BC. Results from the project will include: a base comparison of regulations; legislation and guidelines of other regulatory agencies; a comprehensive assessment of risks related to pipeline abandonment and an action plan to mitigate such risks; and, recommended guidelines for pipeline abandonment.

Benefits:
With a risk assessment completed, the Oil and Gas Commission will be better able to provide clear and safe guidelines to industry for the safe and environmentally sound abandonment of pipelines in BC. Benefits will be noted through results of OGC field inspections.

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Developing guidelines that companies can follow in order to abandon oil and gas pipelines safely, economically and in an environmentally sound manner

Flare and Sump Pits Inventory & Action Plan Tracking Tool

Project Description:
The project is aimed at completing an inventory of flare pits and sumps in northeast BC. This includes building a database that will allow the regulator to report on the progress made in reclaiming these historic sites. The inventory and tracking tool will provide the regulator with the means to better manage the potential health, environmental, and wildlife risks associated with the presence of flare pits on the landscape.

Project Information:
Due to the expansion of oil and gas activities in recent years, the number of sumps and flare pits has increased. Concerns about the potential environmental hazards of sumps and flare pits that have not been rehabilitated prompted this inventory. The results from this project will allow the OGC to ensure that potential environmental risks are identified and that industry action plans manage these risks appropriately.

Benefits:
The OGC will gain: 1) a better knowledge of outstanding environmental liabilities; and, 2) a tool that will enable reporting on industry progress regarding flare pits. The project will enhance oil and gas management practices and result in fewer potential impacts on wildlife and the environment

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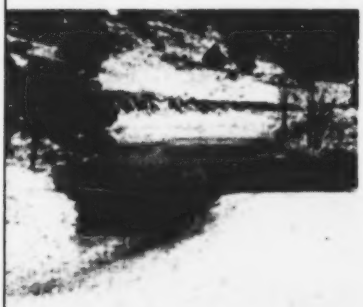

A means to better manage the potential health and environmental risks associated with the presence of flare pits on the landscape

First Nations Special Sites Inventory and Identification

Protecting sites of special interest to the First Nations community

Project Description:
The project pilots the recording of First Nations special sites (cabins, spiritual sites, camping sites, berry and medicine picking sites) through interviews and ground geo-referencing. These sites will be entered into a confidential First Nations Geographic Information System (GIS) database that will allow attributes (notes, pictures, video clips) to be added during the project, and into the future. From the database, site locations will then be forwarded as required to appropriate government agencies for protection from surface disturbances.

Project Information:
By identifying and protecting these sites, the First Nations community will be able to provide more detailed and timely input into tenure sales, applicant projects and application review. This early input will provide more certainty to the land base while protecting sites of special interest to the First Nations community.

Benefits:
The project is expected to enhance relationships and reduce conflicts between government, First Nations and industry by developing a process to identify special sites and protect them, prior to project plan developments. This process can then be expanded to other areas of First Nations interest and lead to increased certainty for resource management planning.

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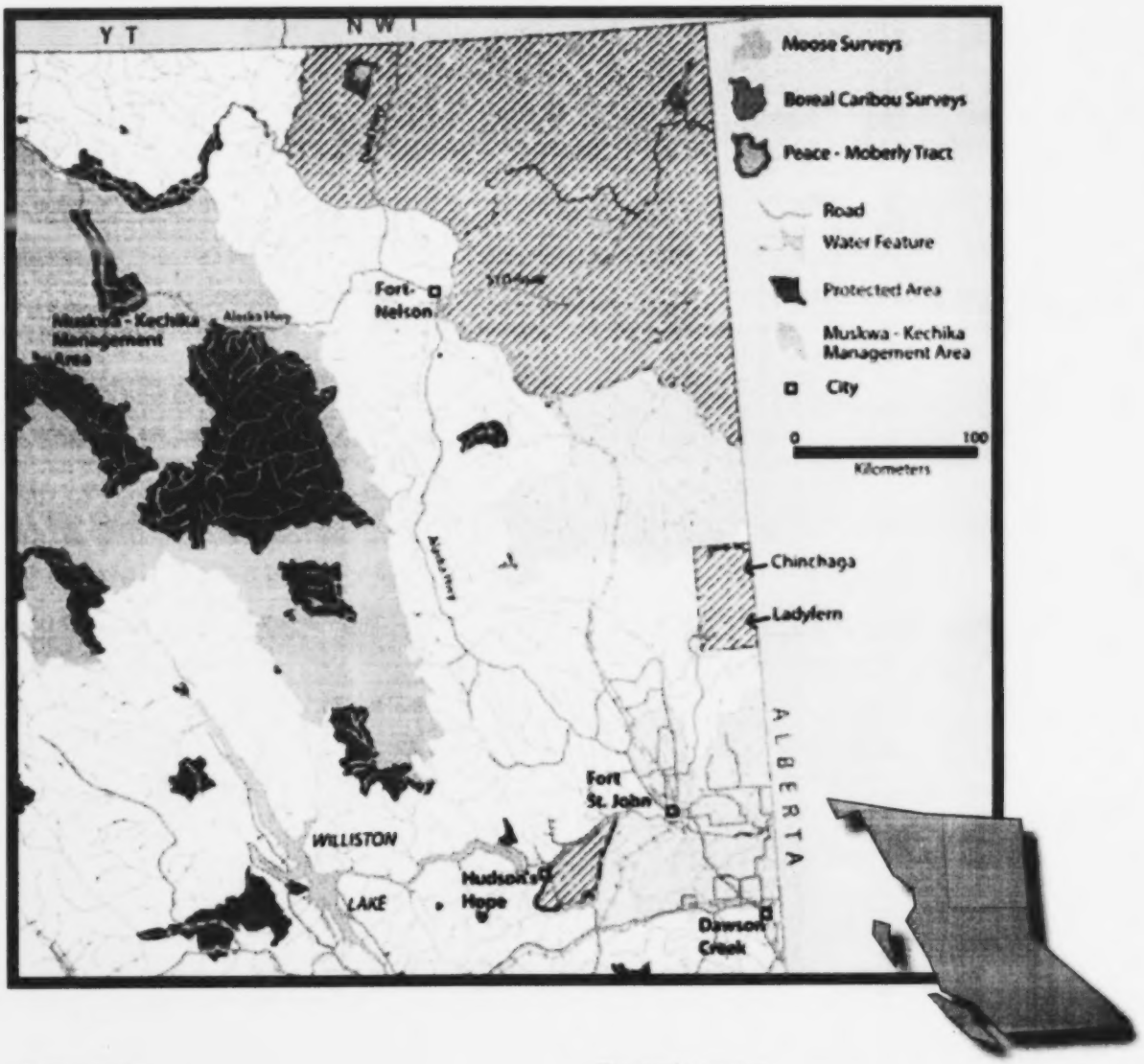
NORTHEAST BC PROJECT WORK 2004/2005



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